

I. AMENDMENTS

Please cancel claims 3 to 11, 31 and 74 without prejudice, and amend the claims as indicated below. Upon entry of the present amendment, the status of the claims will be as follows:

1. (Amended herein) A method for determining whether a test plant has been exposed to an abiotic stress condition, the method comprising contacting, under conditions suitable for hybridization, nucleic acid molecules representative of expressed polynucleotides in cells of the test plant,

with a nucleic acid probe comprising at least 15 nucleotides of a nucleotide sequence as set forth in SEQ ID NO:1034 or SEQ ID NO:3729, or a nucleotide sequence complementary thereto,

and, optionally, with at least one nucleic acid probe ~~under conditions suitable for selective hybridization to a complementary nucleotide sequence, wherein the probe comprises~~ comprising at least 15 nucleotides of a nucleotide sequence as set forth in any of SEQ ID NOS:1-155, 157-228, 230-232, 234-557, 559-572, 574-605, 607-634, 636-786, 788-812, 814-1261, 2227-2585, 2704-2857-2928, 2930-2932, 2934-3256, 3258-3271, 3273-3304, 3306-3323, 3325-3333, 3335-3485, 3487-3511, 3313-3955, and 4910-5263, or a nucleotide sequence complementary thereto,

whereby

detecting selective hybridization of at least one nucleic acid probe, or

detecting a change in a level of selective hybridization as compared to a level of selective hybridization obtained using nucleic acid molecules representative of expressed polynucleotides in cells of a plant known not have been exposed to an abiotic stress, indicates that the test plant has been exposed to an abiotic stress condition, and whereby an absence of selective hybridization of at least one nucleic acid probe indicates that the test plant has not been exposed to an abiotic stress condition.

2. (Original) The method of claim 1, wherein the abiotic stress is cold stress, and wherein the at least one nucleic acid probe comprises a probe comprising at least 15 nucleotides of a nucleotide sequence as set forth in SEQ ID NO:1034 or SEQ ID NO:3729, or a nucleotide sequence complementary thereto, and, optionally,

at least one probe comprising at least 15 nucleotides of a nucleotide sequence as set forth in any of SEQ ID NOS:1-155, 157-228, 230-232, 234-557, 559-572, 574-605, 607-634, 636-786, 788-812, 814-1261, 2704-2857-2928, 2930-2932, 2934-3256, 3258-3271, 3273-3304, 3306-3323, 3325-3333, 3335-3485, 3487-3511, and 3313-3955, or a nucleotide sequence complementary thereto.

3 to 28. (Cancelled)

29. (Amended herein) A method of producing a transgenic plant comprising plant cells that exhibit altered responsiveness to at least ~~one~~ a cold stress condition, the method comprising introducing into a plant cell genome,

a polynucleotide portion of a cold stress-regulated gene comprising a nucleotide sequence as set forth in SEQ ID NO:1034 or SEQ ID NO:3729,

and, optionally, a polynucleotide portion of a plant stress-regulated gene ~~into a plant cell genome, wherein the polynucleotide portion of the stress-regulated gene comprises~~ comprising a nucleotide sequence as set forth in any of 1-155, 157-228, 230-232, 234-557, 559-572, 574-605, 607-634, 636-786, 788-812, 814-1262, 1264-1386, 1387-1390, 1392-1404, 1406-1444, 1446-1483, 1485-1588, 1590-1608, 1610-1633, 1634-1725, 1727-1865, 1867-1917, 1919-1927, 1929-2855, 2857-2928, 2930-2932, 2934-3256, 3258-3271, 3273-3304, 3306-3323, 3325-3333, 3335-3485, 3487-3511, 3313-3956, 3958-4078, 4080-4097, 4099-4136, 4138-4175, 4177-4279, 4281-4299, 4301-4324, 4326-4414, 4416-4552, 4554-4602, and 4604-5379, whereby the polynucleotide portion of the plant stress-regulated gene modulates a response of the plant cells

to at least ~~one~~ a cold stress condition, thereby producing a transgenic plant comprising plant cells that exhibit altered responsiveness to the stress condition.

30. (Amended herein) The method of claim 29, wherein the transgenic plant comprises plant cells that exhibit altered responsiveness to a combination of ~~a combination of~~ at least two stress conditions.

31. (Cancelled)

32. (Amended herein) The method of claim 29, wherein the polynucleotide portion of the ~~plant~~ stress-regulated gene encodes a stress-regulated polypeptide or functional peptide portion thereof.

33. (Original) The method of claim 32, wherein the stress-regulated polypeptide or functional peptide portion thereof increases the stress tolerance of the transgenic plant.

34. (Original) The method of claim 32, wherein the stress-regulated polypeptide or functional peptide portion thereof decreases the stress tolerance of the transgenic plant.

35. (Amended herein) The method of claim 32, wherein the polynucleotide portion of the ~~plant~~ stress-regulated gene is operatively linked to a heterologous promoter.

36. (Amended herein) The method of claim 29, wherein the polynucleotide portion of the ~~plant~~ stress-regulated gene comprises a stress-regulated regulatory element.

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37. (Original) The method of claim 36, wherein, upon introducing the stress-regulated regulatory element into the plant cell, the regulatory element integrates into the plant cell genome in a site-specific manner.

38. (Original) The method of claim 37, wherein, upon integrating into the plant cell genome, the regulatory element is operatively linked to a heterologous nucleotide sequence, which can be expressed in response to a stress condition specific for the regulatory element.

39. (Amended herein) The method of claim 36, wherein the plant stress-regulated regulatory element is a mutant regulatory element, which is not responsive to the stress condition, whereby upon integrating into the plant cell genome, the mutant regulatory element disrupts an endogenous stress-regulated regulatory element of a plant stress-regulated gene, thereby altering the responsiveness of the plant stress-regulated gene to the stress condition.

40. (Original) The method of claim 29, wherein the stress is an abiotic stress.

41. (Original) The method of claim 36, wherein the stress-regulated regulatory element is operatively linked to a polynucleotide encoding a detectable marker.

42. (Original) A transgenic plant produced by the method of claim 29.

43. (Original) A plant cell from the transgenic plant of claim 42, wherein said plant cell exhibits altered responsiveness to the stress condition or stress conditions.

44. (Original) A seed produced by the transgenic plant of claim 42.

45. (Original) A cDNA or genomic DNA library prepared from the transgenic plant of claim 42, or from a plant cell from said transgenic plant, wherein said plant cell exhibits altered responsiveness to the stress condition.

46. (Amended herein) A transgenic plant, which contains a transgene comprising a polynucleotide portion of a cold stress-regulated gene comprising a nucleotide sequence as set forth in SEQ ID NO:1034 or SEQ ID NO:3729, and, optionally, a transgene comprising a polynucleotide portion of plant stress-regulated gene, wherein the gene comprises comprising a nucleotide sequence as set forth in any of SEQ ID NOS:1-155, 157-228, 230-232, 234-557, 559-572, 574-605, 607-634, 636-786, 788-812, 814-1262, 1264-1386, 1387-1390, 1392-1404, 1406-1444, 1446-1483, 1485-1588, 1590-1608, 1610-1633, 1634-1725, 1727-1865, 1867-1917, 1919-1927, 1929-2855, 2857-2928, 2930-2932, 2934-3256, 3258-3271, 3273-3304, 3306-3323, 3325-3333, 3335-3485, 3487-3511, 3313-3956, 3958-4078, 4080-4097, 4099-4136, 4138-4175, 4177-4279, 4281-4299, 4301-4324, 4326-4414, 4416-4552, 4554-4602, and 4604-5379.

47. (Original) The transgenic plant of claim 46, wherein the transgenic plant exhibits altered responsiveness to a stress condition as compared to a corresponding wild-type plant.

48. (Original) The transgenic plant of claim 47, wherein the transgene disrupts an endogenous stress-regulated gene in the plant, thereby reducing or inhibiting expression of the gene in response to a stress condition.

49. (Original) The transgenic plant of claim 46, wherein the plant exhibits increased tolerance to a stress condition.

50. (Original) The transgenic plant of claim 47, wherein the plant exhibits decreased tolerance to a stress condition.

51. (Amended herein) The transgenic plant of claim 46, wherein the transgene comprises a coding sequence of a ~~plant~~ stress-regulated gene.

52. (Original) The transgenic plant of claim 51, wherein the coding sequence is operatively linked to a heterologous regulatory element.

53. (Original) The transgenic plant of claim 52, wherein the regulatory element is a constitutively active regulatory element, an inducible regulatory element, or a tissue specific or phase specific regulatory element.

54. (Amended herein) The transgenic plant of claim 46, wherein the transgene comprises a ~~plant~~ stress-regulated regulatory element operatively linked to a heterologous nucleotide sequence.

55. (Original) The transgenic plant of claim 54, wherein the transgenic plant expresses a polypeptide encoded by the heterologous nucleotide sequence.

56. (Original) The transgenic plant of claim 55, wherein the polypeptide improves the nutritional value or ornamental value of the plant.

57. (Original) The transgenic plant of claim 46, wherein the plant comprises multiple transgenes.

58. (Amended herein) A plant stress-regulated gene regulatory element, wherein the gene comprises a nucleotide sequence as set forth in SEQ ID NO:1034 or SEQ ID NO:3729 ~~any of SEQ ID NOS:1 155, 157 228, 230 232, 234 557, 559 572, 574 605, 607 634, 636 786, 788 812, 814 1262, 1264 1386, 1387 1390, 1392 1404, 1406 1444, 1446 1483, 1485 1588, 1590 1608,~~

~~1610-1633, 1634-1725, 1727-1865, 1867-1917, 1919-1927, 1929-2855, 2857-2928, 2930-2932, 2934-3256, 3258-3271, 3273-3304, 3306-3323, 3325-3333, 3335-3485, 3487-3511, 3513-3956, 3958-4078, 4080-4097, 4099-4136, 4138-4175, 4177-4279, 4281-4299, 4301-4324, 4326-4414, 4416-4552, 4554-4602, and 4604-5379.~~

59. (Amended herein) The plant stress-regulated gene regulatory element of claim 58, comprising a nucleotide sequence as set forth in SEQ ID NO:3729 ~~any of SEQ ID NOS:2704-2855, 2857-2928, 2930-2932, 2934-3256, 3258-3304, 3306-3323, 3325-3333, 3335-3485, 3487-3511, 3513-3956, 3958-4078, 4080-4097, 4099-4136, 4138-4175, 4177-4279, 4281-4299, 4301-4324, 4326-4414, 4416-4552, 4554-4602, 4604-4612, and 4614-5379.~~

60 to 65. (Cancelled)

66. (Amended herein) A method of selecting a plant having an altered resistance to an ~~abiotic~~ a cold stress condition or a combination of abiotic stress conditions comprising a cold stress condition, the method comprising:

a) contacting nucleic acid molecules representative of expressed polynucleotides in a plant cell of a plant to be examined for having an altered resistance to an abiotic stress with a nucleic acid probe that selectively hybridizes under stringent conditions to a cold stress-regulated gene comprising a nucleotide sequence as set forth in SEQ ID NO:1034 or SEQ ID NO:3729,

and, optionally a nucleic acid probe that selectively hybridizes under stringent conditions to a plant stress-regulated gene comprising a nucleotide sequence as set forth in any of SEQ ID NO:1-155, 157-228, 230-232, 234-557, 559-572, 574-605, 607-634, 636-786, 788-812, 814-1262, 1264-1386, 1387-1390, 1392-1404, 1406-1444, 1446-1483, 1485-1588, 1590-1608, 1610-1633, 1634-1725, 1727-1865, 1867-1917, 1919-1927, 1929-2855, 2857-2928, 2930-2932, 2934-3256, 3258-3271, 3273-3304, 3306-3323,

3325-3333, 3335-3485, 3487-3511, 3313-3956, 3958-4078, 4080-4097, 4099-4136, 4138-4175, 4177-4279, 4281-4299, 4301-4324, 4326-4414, 4416-4552, 4554-4602, and 4604-5379;

b) detecting a level of selective hybridization of the nucleic acid probes to a nucleic acid molecule representative of an expressed polynucleotide in the plant cell, wherein the level of selective hybridization corresponds to the level of the expressed polynucleotide in the plant cell, which is indicative of resistance of the plant to an abiotic stress; and

c) selecting a plant having a level of expression of a polynucleotide indicative of altered resistance to an abiotic stress condition comprising a cold stress condition.

67. (Original) A method of expressing a heterologous nucleotide sequence in a plant cell, the method comprising introducing into the plant cell a plant stress-regulated regulatory element of claim 58 operatively linked to the heterologous nucleotide sequence, whereby, upon exposure of the plant cell to stress condition, the heterologous nucleotide sequence is expressed in the plant cell.

68. (Original) The method of claim 67, wherein the heterologous nucleotide sequence encodes a selectable marker.

69. (Original) The method of claim 67, wherein the heterologous nucleotide sequence encodes a polypeptide that improves the nutritional value of the plant cell.

70. (Original) The method of claim 67, wherein the heterologous nucleotide sequence encodes a polypeptide that improves the ornamental value of the plant cell.

71 to 74. (Cancelled)

75. (Original) A method for identifying a polynucleotide involved in a stress response of a plant, the method comprising:

- a) contacting nucleic acid molecules representative of expressed polynucleotides in plant cells of a plant exposed to a stress condition or combination of stress conditions with an array of probes representative of the plant cell genome; and
- b) detecting a nucleic acid molecule that exhibits at least a two-fold change in the level of expression as compared to the level of the nucleic acid molecule in a corresponding plant cell of a plant that was not exposed to the stress condition, thereby identifying a polynucleotide involved in a stress response of the plant.

76 to 79. (Cancelled)

80. (Previously presented) An isolated polynucleotide, comprising SEQ ID NO:1034.

81. (Previously presented) The isolated polynucleotide of claim 80, further comprising an operatively linked stress responsive regulatory element comprising SEQ ID NO:3729.

82. (Previously presented) A recombinant nucleic acid molecule, comprising the isolated polynucleotide of claim 80 operatively linked to a heterologous nucleotide sequence.

83. (Previously presented) A vector, comprising the polynucleotide of claim 80.

84. (Previously presented) The vector of claim 83, which is an expression vector.

85. (Previously presented) A cell containing the isolated polynucleotide of claim 80.

86. (Previously presented) The cell of claim 85, which is a plant cell.

II. REMARKS

Upon entry of the present amendment, claims 1, 2, 29, 30, 32 to 59, 66 to 70, 75, and 80 to 86 will be pending.

Applicants and Applicants' representative gratefully acknowledge the helpful comments and clarification of the issues set forth in the Communication mailed August 12, 2003, by the Examiner in a telephone conference held August 22, 2003.

A. Regarding the Amendments

Pursuant to the Restriction Requirement, claims 3 to 11 and 31, which are directed to a non-elected invention, and claim 74, which should have been included in Group V of the Restriction Requirement (Paper No. 7) and, therefore, is directed to a non-elected invention, are cancelled herein without disclaimer, and without prejudice to Applicants' pursuing prosecution of subject matter encompassed within one or more of the cancelled claims in an application claiming the benefit of priority of the subject application.

Claims 1, 2, 3, 46 and 66 have been amended to clarify that the claimed methods or compositions require at least an elected polynucleotide (i.e., SEQ ID NO:1034 or SEQ ID NO:3729) and, optionally", one or more additional polynucleotides as recited. The amendments are supported by the language of the claims as originally filed, which allow for the use of "at least" one of the recited polynucleotides and, therefore, combinations, and, for example, at paragraph 178 (page 90). As such, the amendments do not add new matter.

Claims 29 and 66 also have been amended to clarify that the at least one stress condition (claim 29) or abiotic stress condition (claim 66) includes at least a "cold stress" condition, thus conforming to the elected polynucleotides, which comprise a cold stress-regulated gene (see, e.g.,

paragraph 11, bridging pages 4-5). The amendments are supported, for example, at paragraph 52 (page 29) and, therefore, do not add new matter.

Claim 30 has been amended to delete duplicate recitation of the term "a combination of". As such, the amendment merely corrects a word processing error, and does not add new matter.

Claims 32, 35, 36 and 39, which depend from claim 29, and claim 51, which depends from claim 46, have been amended to delete the term "plant" in reference to a stress-regulated gene. The amendments are necessitated by the election of SEQ ID NOS:1034 and 3729 (a cold stress regulated gene) pursuant to the restriction requirement, and the related amendment to claims 29 and 46 to recite "cold stress-regulated gene". The term "stress-regulated gene" in amended claims 32, 35, 36 and 39 and claim 51 can refer back to the cold stress-regulated gene and an optional plant stress-regulated gene of claim 29 and claim 46, respectively. As such, it is submitted that these amendments merely address a formality.

Claims 58 and 59 have been amended to recite only the elected polynucleotides. As such, the amendment is necessitated by the restriction requirement and, therefore, does not add new matter.

B. Regarding the Communication mailed August 12, 2003

It is stated in the Communication that it was unclear as to what was elected because it appeared that Group I was elected, then SEQ ID NOS:1034 and 3729, then the combination of claim 2, many of which embraced combinations other than the elected sequences. Further to the discussion with the Examiner, the claims have been amended to clarify that the claimed subject matter requires at least a nucleotide sequence of SEQ ID NO:1034 or SEQ ID NO:3729, or, in certain claims, a sequence complementary thereto. As such, it is submitted that the amended claims clarify that any combination, when present, requires at least a nucleotide sequence of SEQ ID NO:1034 or SEQ ID NO:3729, or a sequence complementary thereto.

It is further stated in the Communication that the relationship of SEQ ID NOS:1034 and 3729 is unclear. As discussed with the Examiner, SEQ ID NOS:1034 and 3729 comprise a gene coding sequence and the immediately adjacent and upstream 5' regulatory sequence, respectively. It is because SEQ ID NOS:1034 and 3729 together comprise a contiguous gene sequence that it is requested that SEQ ID NO:3729 be examined with elected SEQ ID NO:1034.

Referring to Exhibits A, B and C submitted with Applicants' Amendment mailed May 14, 2003 in response to the Restriction Requirement, SEQ ID NO:1034 includes the coding sequence of the *Arabidopsis* PCF2 DNA binding protein (Exhibit C) and SEQ ID NO:3729 comprises the 5' regulatory sequence, a portion of which is shown in Exhibit C. More specifically, the ATG shown as the first three nucleotides of SEQ ID NO:1034 can be found as nucleotides 103 to 105 of the PCF2 DNA binding protein sequence shown in Exhibit C. Further, the final five nucleotides (TTTTA) of SEQ ID NO:3729 can be found as nucleotides 99 to 102 of Exhibit C. Thus, SEQ ID NO:3729 comprises 5' regulatory sequences that are upstream from and immediately adjacent to SEQ ID NO:1034 and, therefore, the sequences together constitute a portion of the PCF2 DNA binding protein, including the entire coding sequences and 1677 nucleotides 5' to the coding sequence.

Applicants further point out that the relationship of SEQ ID NO:1034 and SEQ ID NO:3729 is set forth in Table 2 (page 148) of the subject application, wherein the SEQ ID NOS: of coding sequences and their related regulatory sequences are shown in consecutive columns (see column heading at page 142, first page of Table 2). Thus, SEQ ID NO:1034 is shown in column 3 and SEQ ID NO:3729 is shown next to it in column 4, indicating that SEQ ID NO:3729 comprises the stress (i.e., cold) responsive regulatory element of elected SEQ ID NO:1034.

In view of the amendments and above remarks, it is submitted that the elections pursuant to the Restriction Requirement and the subject matter claimed as the invention has been clarified. The

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Examiner is invited to contact Applicants' undersigned representative if there are any questions relating to this application.

No fee is deemed necessary in connection with the filing of this Response. However, if any fee is required, the Commissioner is authorized to charge any fee (or credit any overpayment) to Deposit Acct. No. 50-1355.

Respectfully submitted,

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for By: Richard J. Timber *Reg. No. 38,347*
Lisa A. Haile, J.D., Ph.D.
Reg. No. 38,347
Telephone: (858) 677-1456
Facsimile: (858) 677-1465

USPTO CUSTOMER NUMBER 28213
GRAY CARY WARE & FREIDENRICH LLP
4365 Executive Drive, Suite 1100
San Diego, CA 92121-2133